Research Items.

Problems of Race and Nationality in South Africa.—The problems of race and nationality are discussed in the presidential address delivered before the South African Association for the Advancement of Science by the president, Dr. J. E. Duerden. He gives an instructive survey of the social condition of the Bantu races and of the European immigrants. The hereditary attributes of all the people of colour are markedly inferior to the white in all that pertains to the requirements of modern civilisation, and there is every reason to expect that they will remain so in the future, "for in considerations of this nature the teachings of zoology are overwhelmingly in favour of the unchangeableness of the germ plasm." He goes on to say that the Nordic race, represented by the English and Dutch, stands at the head of the human genus, and "it is in the daily competition with those that the Bantu, Indian, and Malay are to lead their lives. In the commingling of these races in South Africa there can be no question as to which will be dominant. In his hereditary endowments the white is far more gifted than the coloured, and must lead. Dominance, however, is not arrogance, nor does superiority necessarily carry with it harshness or unfairness."

Secret Societies in the Southern Sudan.—The spread of secret societies among the Sudanese is a question of some political importance, and the reports of several correspondents on the subject are summarised in *Sudan Notes and Records* (vol. iv. No. 4). The baneful influence of such associations has attracted the attention of the Government, which has recently revised "The Unlawful Societies' Ordinance" in order to bring them under control. The authorities emphasise their evil influence through terrorism, debauch, and robbery, and it is suggested that they are mainly the work of unscrupulous persons who exploit the fears of primitive man for their own nefarious ends. But, as is the case with similar organisations among tribes of the lower culture elsewhere, it is believed that the use of "fetish" or other magical objects in their rites implies a religious side to the practices of these societies which deserves to be more closely studied. It would be interesting to learn whether these cults are regarded as supplementary or antagonistic to the traditional beliefs and rites of the uninitiated members of the community, and whether their influence depends on the transitory prestige of some particular leader, or is deeply rooted in the official religion of the tribe.

Geology of Mesopotamia. — An interesting memoir just issued by the Geological Survey of India (Memoirs, vol. xlviii., 1922) embodies the results of Dr. E. H. Pascoe's reconnaissance of the part of Mesopotamia lying mainly to the east of the Tigris from about the latitude of Baghdad to that of the Great Zab river just below Mosul. Excluding the recent alluvium and the pleistocene conglomerates, the rock groups described are all of Tertiary age and fall naturally into two divisions:—(*a*) a lower, marine, gypsiferous series corresponding to a part of Dr. Pilgrim's Fars series of the Persian Gulf region; and (*b*) a younger fluviatile series, which is provisionally named the Kurd series and corresponds generally with the beds distinguished by Dr. Pilgrim as the Bakhtiyari series in Persia. The older, marine, gypsiferous beds were laid down in a relatively shallow gulf, which became silted up and finally gave place to fluviatile conditions after an intermediate stage of salt lagoons. Local erosion naturally occurred during this transition stage, but there is no general or widespread unconformity dividing the marine from the later freshwater formations by which the former were covered. Folding of the sediments commenced in Fars times and became accentuated during the subsequent Kurd period, persisting into recent times; this is indicated by the marked steepening of the dips noticeable in passing from the upper to the lower series, while there is in general a marked contrast between the compressed condition of the anticlines and the open disposition of the alternating synclinal folds, which Dr. Pascoe ascribes to the circumstance that the rising anticlinal saddles became eroded and consequently weakened, thus yielding more readily to compressional earth-movements. Petroleum is of outstanding importance among the minerals of economic value, and the conditions for its occurrence are so favourable that Dr. Pascoe regards Mesopotamia as a possible rival of Persia, outclassing Burma altogether in oil resources. Associated with the oil are small quantities of pitch and bitumen, while sulphuretted hydrogen is evolved in such large quantities that its recovery as a source of sulphur (or alternatively as sulphuric acid) is recommended as commercially feasible.

American Cretaceous Dinosaurs.—The first of a series of preliminary notices on the Cretaceous dinosaurs, obtained in Alberta from 1910 to 1915 by parties sent out by the American Museum of Natural History under Mr. Barnum Brown, has been issued. The article in question, by W. D. Matthew and B. Brown (Bull. Amer. Mus. Nat. Hist., vol. xlvi.) treats of "The family Deinodontidæ." This family name was introduced by Cope in 1866, under what is now considered the more correct rendering for the Greek, as Dinodontidæ, but the authors of the present brochure have altered it, presumably because the type genus, when founded by Leidy in 1856, was rendered, as then customary, as Deinodon. But if Leidy's original is to be scrupulously adhered to, why not Cope's? The authors discuss the group and give a most valuable "Chronological list of American Cretaceous Deinodonts and Ornithomids." Appended is a description of *Dromæosaurus albertensis*, n. gen. et sp., from the Cretaceous of Alberta, and the conclusion is reached that it should be placed in a distinct subfamily, Dromæosaurinæ.

Entelodonts from the Oligocene of South Dakota.—W. J. Sinclair describes the "Entelodonts from the Big Badlands of South Dakota in the Geological Museum of Princeton University" (Proc. Amer. Phil. Soc., vol. lx.), some of which had been previously inadequately determined, and had even figured in literature under other names. The new forms include two new species of Archæotherium and *Scaptohyus altidens*, n. gen. et sp. The origin of the group as a whole is uncertain. Apart from the digging proclivities of Scaptohyus, one of the most clearly indicated "habits" of the entelodonts, according to the author, judging from lesions in the preserved remains, appears to have been their pugnacity; but surely the argument is equally allowable that the injuries were due to attacks by powerful enemies.

Petroleum in the Philippines.—In the *Philippine Journal of Science* of January last, Dr. Warren D. Smith gives a detailed account of his geological reconnaissance of the Pidatan Oilfield, Cotabato Province, Mindanao, the second largest island of the Philippine group. The occurrence of petroleum in the Philippine Islands has been known for some years, surface indications existing in Luzon, Mindoro,

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Panay, Cebu, and Leyte; those of the Cotabato district in Mindanao, in particular the Pidatan seepage, are of more recent discovery, Pidatan not receiving detailed geological attention until the expedition of 1921, of which this paper is a report. The Pidatan field is about 60 kilometres north of Fort Pikit, Cotabato Province, the basin of the Rio Grande de Cotabato, practically in the centre of the island. The topography is mountainous and the country is exceedingly difficult. Geologically, the formations present consist principally of Tertiary limestones, sandstones, and shales pierced by basaltic and andesitic intrusions. The sediments are of recent, Pleistocene, Pliocene, and Miocene ages, many horizons yielding fossil evidence. The structures, however, appear to be very complex, owing to the regional earth movements and the igneous activity manifested. In fact, the faulting and folding has so disturbed the oilfield region that Dr. Smith does not hesitate to condemn the area from the economic point of view. On the other hand, the presence of the seepage and the nature of the oil involved at Pidatan suggest that petroleum certainly occurs in central Mindanao, possibly over an extensive region, and the advisability of intensive geological exploration over a wider area is clearly indicated. Analysis of the oil from the occurrence at Pidatan shows that it has a specific gravity of 0·9297 and is of paraffin base; no light fraction was obtained (under 150° C.), kerosene and heavy oil representing 45 per cent. and 49·5 per cent. of the sample respectively (by volume). Results of other tests indicate that the oil is much inspissated, as would be expected considering the geological circumstances, and is most suitable for use as a Diesel engine fuel. The author concludes his paper with a commendable caution to those controlling oil companies against belittling the value of sound geological work as a necessary preliminary to oil exploration; while not detracting from the value of the "practical" man's work, he makes it quite clear that success is achieved only where both driller and geologist work in harmony, a conclusion deserving of serious consideration by many of the would-be "wild-cat" oil explorers in our own colonies.

THE GEOLOGY OF THE MOUNT EVEREST DISTRICT.—The Mount Everest expedition of last year included among its staff Dr. A. M. Heron, who contributes to the *Geographical Journal* of June an account of his geological investigations, accompanied by a geological map. The mapping is virtually a westward continuation of Sir H. Hayden's investigations during the Tibet Expedition of 1903–4. Dr. Heron's task was one of unusual difficulty. Over much of the area examined his work had to proceed in advance of surveys, while the movements of the expedition were generally unfavourable to detailed work. Close and prolonged examination, moreover, was considered inadvisable, since it aroused the suspicions of the Tibetans. Dr. Heron claims that his work must be looked on only as a reconnaissance. The area examined covers more than 8000 square miles, and consists in the main of the Tibetan portion of the drainage area of the Arun river above Kharta. Two geological divisions can be recognised: a Tibetan area of sedimentary rocks which consists chiefly of east and west folds of Jurassic slates, and the crystalline Himalayan region to the south. The contrasts in topography clearly illustrate the differences in the underlying structure. On one hand are the somewhat tame rounded ranges, with broad valleys, of Tibet, and on the other the high, steep, and rugged Himalayas.

RECOVERY OF SUGAR FROM BEET MOLASSES.—Beet molasses is a substance of almost constant composition, containing 50 per cent. of sugar, 10 per cent. of ash, 15 per cent. of other organic substances, and 25 per cent. of water. The sugar cannot be separated from it by direct means, and among the methods employed for recovering the sugar is precipitation by one of the alkali earths. Until the present lime and strontia have chiefly been used. In the year 1838, however, Peligot found that baryta forms a very sparingly soluble saccharate. The use of baryta for the purpose of separating sugar was never carried out to any great extent for two reasons; (*a*) its cost, and (*b*) the poisonous nature of barium compounds. The cost of baryta should now be considerably reduced by the discovery of two French chemists, MM. Camille Deguide and Paul Baud (*Comptes rendus*, May 1), who find that when barium carbonate is heated with silica at a temperature of 150°-200° C., and the mixture subsequently lixiviated with water, the carbonate is to the extent of more than 90 per cent. converted into hydroxide. This process should therefore render baryta available for the desaccharification of molasses. It is, however, very doubtful whether any Government will permit its use on account of the toxic character of traces of barium compounds.

PYREX GLASS.—The *Chemiker Zeitung* of May 25 contains an analysis of the "Pyrex glass" manufactured in America and used for cooking vessels. This glass is an astonishing resistant to changes of temperature, and may be used over an open fire. The chemical composition was found to be, in percentages: silica, 80·71; boric anhydride (B_2O_3), 10·47; alumina, 3·55; lime, 0·70; magnesia, 0·57; soda (Na_2O), 4·14. The low alkali content is noteworthy. Experiments showed that ordinary heating is not sufficient to melt the materials for such a glass, and special furnaces, possibly with surface-combustion heating, are assumed.

SAFETY DEVICES IN WIRELESS EQUIPMENT.—The American Bureau of Standards has given its approval to the recommendations of a committee of the National Fire Protection Association proposing the addition of some new safety rules to the National Electric Code relating to wireless telegraph installations. The proposed regulations provide for the protection of receiving and transmitting equipment against lightning effects, avoidance of risk of contact with neighbouring electric light and power circuits, and protection from effects of high potential surges in the lines supplying power to the equipment, as well as the ordinary requirements of sound construction. It is needless to detail all the proposals, but it may be remarked that, in the case of receiving equipments, a lightning arrester is required where the leading-in wire enters a building and, on account of the larger size of the ordinary transmitting aerial, which is more likely to be subject to damage from lightning, and the high voltages produced in the apparatus, the provision is recommended in transmitting stations of a double-throw switch for connecting the aerial either to the transmitting apparatus or to earth. The use of this switch makes it possible to disconnect the aerial entirely from the transmitting apparatus. On account also of the difficulty which has been experienced by the induction of voltages in the supply lines of a transmitting station, it is advisable to use a protective device across the power line near its point of entrance. It is noticeable that copper-clad steel wire is recommended throughout as an alternative to copper wire, owing to the fact that these two kinds of wire are practically equivalent in their conductivity for high-frequency current, while the former is stronger mechanically.

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